WE CLAIM

1. A method for producing a full-length antibody in a host plant using a virus, the method comprising:

(a) constructing a first recombinant viral vector for infection which comprises a recombinant genomic component of the virus having a movement protein encoding nucleic acid sequence and a coat protein nucleic acid sequence, and a nucleic acid sequence for the heavy chain of the antibody cloned into the recombinant genomic component such that the expression of the recombinant genomic component also results in the expression of the heavy chain of the antibody;

(b) constructing a second recombinant viral vector for infection which comprises the same recombinant genomic component as in step (a) except that a nucleic acid sequence for the light chain of the antibody is cloned into the recombinant genomic component instead of the heavy chain such that the expression of the recombinant genomic component also results in the expression of the light chain of the antibody;

(c) infecting the host plant at one or more locations with the first recombinant viral vector and the second recombinant viral vector such that the infection of said plant with the first and second recombinant viral vectors results in systemic infection in the host plant;

(d) expressing the first and second recombinant genomic components, wherein the heavy and light chains resulting from the expression are assembled into the full-length antibody in the host plant.

2. The method of claim 1, wherein the full-length antibody is a monoclonal antibody.

3. The method of claim 1, wherein the full-length antibody is directed to an antigen selected from the group consisting of hepatitis B surface antigen, enterotoxin, rabies virus glycoprotein, rabies virus nucleoprotein, Norwalk virus

capsid protein, gastrointestinal cancer antigen, G protein of Respiratory Syncytial Virus, Sandostatin, anthrax antigen or colorectal cancer antigen.

4. The method of claim 1, wherein said host plant is a dicotyledon or a monocotyledon.

5. A full-length monoclonal antibody produced in a virus infected plant comprising a heavy chain and a light chain, wherein the heavy chain and the light chain are assembled *in planta* to form the full-length monoclonal antibody, and wherein the heavy chain results from the expression of a first recombinant genomic component of the virus carrying the heavy chain gene and the light chain results from the expression of a second recombinant genomic component of the virus carrying the light chain gene in said plant.

6. The full-length monoclonal antibody of claim 5, being wherein the full-length antibody is directed to an antigen selected from the group consisting of hepatitis B surface antigen, enterotoxin, rabies virus glycoprotein, rabies virus nucleoprotein, Norwalk virus capsid protein, gastrointestinal cancer antigen, G protein of Respiratory Syncytial Virus, Sandostatin, anthrax antigen or colorectal cancer antigen.

7. The full-length monoclonal antibody produced according to the method of claim 6, wherein the antibody has higher affinity for an antigen than the same antibody produced in a mammalian cell.

8. A method for producing a full-length antibody in a host plant through functional transcomplementation of a virus, the method comprising:

(a) constructing a first recombinant viral vector for infection which comprises a recombinant genomic component of the virus having a movement protein encoding nucleic acid sequence and a coat protein nucleic acid sequence, and

a nucleic acid sequence for the heavy chain of the antibody cloned into the recombinant genomic component such that the expression of the recombinant genomic component also results in the expression of the heavy chain of the antibody;

(b) constructing a second recombinant viral vector for infection which comprises the same recombinant genomic component as in step (a) except that a nucleic acid sequence for the light chain of the antibody is cloned into the recombinant genomic component instead of the heavy chain such that the expression of the recombinant genomic component also results in the expression of the light chain of the antibody;

(c) infecting said plant at one or more locations with the first recombinant viral vector and the second recombinant viral vector such that the infection of said plant with the first and second recombinant viral vectors results in systemic infection in said plant,

wherein the first and second recombinant viral vectors are deficient for the virus replicase function, and the host plant is transgenic for expressing replicase genes of a virus to complement the virus replicase function, and the heavy and light chains resulting from the expression of the first and second recombinant genomic components are assembled to a full-length antibody; and

(d) expressing the first and second recombinant genomic components, wherein the heavy and light chains resulting from the expression are assembled into the full-length antibody in the host plant.

9. An isolated full-length antibody comprising a heavy chain and a light chain, wherein the antibody is isolated from a plant tissue containing the full-length antibody produced according to the method of claim 1.

10. A composition comprising the full-length antibody according to claim 9 and a pharmaceutically acceptable carrier.

11. An isolated full-length antibody comprising a heavy chain and a light chain, wherein the antibody is isolated from a plant tissue containing the full-length antibody produced according to the method of claim 8.

12. A recombinant full-length antibody having at least three fold higher binding affinity to the corresponding antigen than the parent antibody.

13. A recombinant full-length antibody having at least six fold higher binding affinity to the corresponding antigen than the parent antibody.

14. A recombinant full-length antibody having at least ten fold higher binding affinity to the corresponding antigen than the parent antibody.

15. A recombinant full-length antibody having at least ten fold higher binding affinity to the corresponding antigen than the parent antibody.

16. A recombinant full-length antibody having a lower dissociation constant than the parent antibody.